

CLAIMS

What is claimed is:

1. A surgical clip with an integral cutting guide, comprising:
 - (a) a first leg and a second leg, each of said legs having an inner vessel-clamping surface, an outer surface and a pair of opposing side surfaces flanking said inner and outer surfaces, said inner surfaces being positioned in opposition to each other;
 - (b) a flexible hinge section integrally disposed between and joining the proximal ends of said first and second legs;
 - (c) at least one cutting guide extending outward from and disposed along at least a portion of the length of at least one of said opposing side surfaces on at least one of said first and second legs; and
 - (d) a female locking member positioned on the distal end of said first leg and a male locking member positioned on the distal end of said second leg, said female and male locking members being formed whereby when said first and second leg members are moved from an open position to a closed position about said hinge section, said male locking member is lockingly engaged in said female locking member so as to removably lock said first and second leg members of said surgical clip in said closed position.
2. The surgical clip of claim 1, wherein said at least one cutting guide comprises a plurality of cutting guides, wherein said first and second legs each have at least one of said plurality of cutting guides disposed thereon.
3. The surgical clip of claim 2, wherein at least one of said cutting guides is disposed on each of said opposing side surfaces.
4. The surgical clip of claim 1, wherein said at least one cutting guide

extends outward from said side surface to a height of about 3.0 mm or less.

- 5 5. The surgical clip of claim 1, wherein said at least one cutting guide has an elongated shape, whereby the length of said cutting guide is greater than the width of said cutting guide.
- 10 6. The surgical clip of claim 1, further comprising a pair of bosses joined to opposite sides of said first leg between said hinge section and the distal end of said first leg, and a pair of bosses joined to opposite sides of said second leg at the distal end of said second leg.
- 15 7. The surgical clip of claim 6, wherein said at least one cutting guide is disposed along at least a portion of the length of at least one of said opposing side surfaces between said hinge section and said bosses.
- 20 8. The surgical clip of claim 7, wherein said at least one cutting guide is disposed adjacent said hinge section along at least a portion of the length of at least one of said opposing side surfaces.
9. The surgical clip of 6, wherein a portion of said pair of bosses joined to said first leg extend beyond said outer surface of said first leg to form a bridge section.
- 25 10. The surgical clip of claim 6, wherein said pair of bosses on said second leg each have a sharp tissue-penetrating tooth extending outwardly therefrom toward said first leg.
- 30 11. The surgical clip of claim 1, wherein said inner surface of said first leg has a concave radius of curvature between said hinge section and its distal end, said outer surface of said first leg has a convex radius of curvature between said hinge section and its distal end, said inner

surface of said second leg has a convex radius of curvature between said hinge section and its distal end, and said outer surface of said second leg has a concave radius of curvature between said hinge section and its distal end.

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12. The surgical clip of claim 1, wherein at least one of said inner surfaces of said clip comprises a plurality of protrusions extending from said inner surface for providing improved vessel retention during and following closure of said clip.

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13. The surgical clip of claim 12, wherein both of said inner surfaces of said clip comprise said plurality of protrusions.

14. The surgical clip of claim 1, wherein said hinge section has a continuous concave inner surface and a continuous convex outer surface.

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15. The surgical clip of claim 1, wherein said female locking member comprises a resilient inwardly turned hook curved toward said second leg member.

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16. The surgical clip of claim 15, wherein said male locking member is complementary to said hook of said female locking member whereby when said first and second leg members are moved from an open position to a closed position about said hinge section, said resilient hook of said female locking member contacts said male locking member and is urged open to receive said male locking member so as to removably lock said first and second leg members of said surgical clip in said closed position.

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17. A surgical clip with an integral cutting guide, comprising:

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(a) a first leg and a second leg, each of said legs having an inner vessel-clamping surface, an outer surface and a pair of opposing side surfaces flanking said inner and outer surfaces, said inner

- 5 surfaces being positioned in opposition to each other;
- (b) a flexible hinge section integrally disposed between and joining the proximal ends of said first and second legs;
- (c) a plurality of cutting guides, each extending outward from and disposed along at least a portion of the length of each of said opposing side surfaces of each of said first and second legs; and
- 10 (d) a female locking member positioned on the distal end of said first leg and a male locking member positioned on the distal end of said second leg, said female and male locking members being formed whereby when said first and second leg members are moved from an open position to a closed position about said hinge section, said male locking member is lockingly engaged in said female locking member so as to removably lock said first and second leg members of said surgical clip in said closed position.
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18. The surgical clip of claim 17, wherein each of said cutting guides extends outward from said side surface to a height of about 3.0 mm or less.
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19. The surgical clip of claim 17, wherein each of said cutting guides has an elongated shape, whereby the length of said cutting guide is greater than the width of said cutting guide.
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20. The surgical clip of claim 17, further comprising a pair of bosses joined to opposite sides of said first leg between said hinge section and the distal end of said first leg, and a pair of bosses joined to opposite sides of said second leg at the distal end of said second leg.
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21. The surgical clip of claim 20, wherein each of said cutting guides is disposed along at least a portion of the length of a corresponding one of

said opposing side surfaces between said hinge section and said bosses.

- 5 22. The surgical clip of claim 21, wherein each of said cutting guides is disposed adjacent said hinge section along at least a portion of the length of a corresponding one of said opposing side surfaces.
- 10 23. The surgical clip of 20, wherein a portion of said pair of bosses joined to said first leg extend beyond said outer surface of said first leg to form a bridge section.
- 15 24. The surgical clip of claim 20, wherein said pair of bosses on said second leg each have a sharp tissue-penetrating tooth extending outwardly therefrom toward said first leg.
- 20 25. The surgical clip of claim 17, wherein said inner surface of said first leg has a concave radius of curvature between said hinge section and its distal end, said outer surface of said first leg has a convex radius of curvature between said hinge section and its distal end, said inner surface of said second leg has a convex radius of curvature between said hinge section and its distal end, and said outer surface of said second leg has a concave radius of curvature between said hinge section and its distal end.
- 25 26. The surgical clip of claim 17, wherein at least one of said inner surfaces of said clip comprises a plurality of protrusions extending from said inner surface for providing improved vessel retention during and following closure of said clip.
- 30 27. The surgical clip of claim 26, wherein both of said inner surfaces of said clip comprise said plurality of protrusions.

28. The surgical clip of claim 17, wherein said hinge section has a continuous concave inner surface and a continuous convex outer surface.
- 5 29. The surgical clip of claim 17, wherein said female locking member comprises a resilient inwardly turned hook curved toward said second leg member.
- 10 30. The surgical clip of claim 29, wherein said male locking member is complementary to said hook of said female locking member whereby when said first and second leg members are moved from an open position to a closed position about said hinge section, said resilient hook of said female locking member contacts said male locking member and is urged open to receive said male locking member so as to removably
- 15 lock said first and second leg members of said surgical clip in said closed position.